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CLASSIFICATION

GROUP

GT. BRITAIN

PATENT SPECIFICATION

987,834



DRAWINGS ATTACHED

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No. 35544/63.

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GT. BRIT.
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Int. Cl.:—B 29 d, f // F 06 g

COMPLETE SPECIFICATION

Transmission Belt and method of manufacture

We, DAYCO CORPORATION, of 333 West First Street, Dayton 2, Ohio, United States of America, a corporation organized under the Laws of the State of Ohio, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to an improved transmission belt and method of manufacture, and is concerned more particularly with V-type belts.

15 It is well known that transmission belts are utilised for transferring power from a driving pulley to a driven pulley by passing the belt in a continuous manner around the pulleys. The conventional transmission belt has its inner section placed in compression while its outer section is placed in tension and separated from the compression section by a neutral section having reinforcing means therein, and an outer cover. Such a transmission belt is normally manufactured by concentrically 20 assembling these sections, cutting them into belt bodies and vulcanizing them to form an integral structure. One method of vulcanizing consists of placing the belt bodies in an open mould cavity and applying heat and pressure thereto, usually by hydraulic means.

25 The known methods result in belts that often require trimming. In some instances the inner surfaces tend to crack, and the scrap rate of such belts is fairly high. Further, these methods require relatively close tolerances to produce a satisfactory belt and an expensive hydraulic press is usually required. The present invention provides an improved method for forming such transmission belts without the 30 above disadvantages. In particular, one feature of this invention involves cure of the belt body in such a manner that the pressure or force is created inside the body to tend to stretch the cover, whereby the belt is cured using 35 internal forces and not with external forces as in the past.

[Price 4s. 6d.]

It is an object of this invention to provide an improved transmission belt.

Another object of this invention is to provide an improved method for making such a transmission belt.

5 A transmission belt according to the invention comprises a body of elastomeric material enclosed by a stretched outer cover, wherein the elastomeric material forming a part of said body is a blown elastomeric material.

10 Further, according to the invention a method of making a transmission belt having a body formed of an elastomeric material and a cover enclosing said body comprises the steps of adding a blowing agent to elastomeric material, building up the belt body so that a part or parts thereof extending throughout its length and bounded by an external surface of the body is or are formed of said elastomeric material to which the blowing agent has been added, placing a cover about the said body so that it contacts said part or parts thereof, and heat-curing the said body in a mould cavity to cause the blowing agent to expand and stretch said cover.

15 The invention is illustrated by way of example in the accompanying drawings, in which:—

20 Figure 1 is a perspective view in partial cross-section illustrating a typical transmission belt manufactured in accordance with the present invention.

25 Figure 2 is an enlarged, fragmentary cross-sectional view illustrating one step in the method of forming the transmission belt according to this invention.

30 Figure 3 is a view similar to Figure 2 illustrating another step in the method according to this invention.

35 Figure 4 is a perspective view illustrating one form of an apparatus that can be utilized in carrying out the invention.

40 Figure 5 is a view similar to Figure 1 illustrating a further form of the invention.

45 Figure 6 is a view similar to Figure 2 illustrating still another form of the invention.

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trated in Figures 6 and 7, in which a belt 31 having a double truncated vee cross section is illustrated. The belt referred to is generally known as a double-V belt. In this case, the belt consists of a central reinforced section having on each side thereof sections 32 and 33 which may be considered as either tension or compression sections, depending on the relationship of the belt to the driving pulley.

At the centre of the belt is the neutral section 36, comprising strength cords 37; between the neutral section and the section 32 is a main body section 34, while between the neutral section and the section 33 is another main body section 35. A stretchable fabric cover 38, similar to cover 16, envelops the belt. In this case, the sections 32 and 33 are of blown sponge rubber, having been formed by adding a blowing agent to the elastomeric material destined to form these sections, mixing it with the said elastomeric material by milling, forming layers of this material in the belt body as at 17 in Figure 6, then exposing the belt to curing as previously described. The apparatus by which this belt is cured is similar to the apparatus 18, except that the central body 40 and the movable cover 39 of the mould have cavities which represent a half-section of the belt. When the cover is closed on the main body as shown, the belt body does not quite fill the cavity, as gaps are left above and below the body as shown in Figure 6. This gap permits the cover to stretch when curing takes place and blowing of the rubber forming the sections 32 and 33 takes place.

It can be seen that by making the bodies initially smaller than the mould cavities, the bodies can vary within very liberal limits and the resulting belts will all be substantially uniform as the same will be stretched to completely fill the mould cavities during the curing operation. As a result, the manufacturing tolerances of the bodies need not be as tightly controlled as in the past.

It can be seen that this invention provides an improved transmission belt, as well as an improved method for making the transmission belt without requiring expensive apparatus or requiring trimming of the finished belt. The proportion of unsatisfactory belts which have to be scrapped is far less than is obtained with known methods of production. Other forms are also contemplated without departing from the scope of the invention as defined by the claims.

WHAT WE CLAIM IS:—

1. A transmission belt comprising a body of elastomeric material enclosed by a stretched outer cover, wherein the elastomeric material forming a part of said body is a blown elastomeric material.
2. A transmission belt according to claim 1, wherein the belt is a V-belt, the body being provided at its neutral axes with reinforcement dividing the said body into a tension section and a compression section.
3. A transmission belt according to claim 2, wherein the blown elastomeric material forms a part of the compression section of the belt.
4. A transmission belt according to claim 2, wherein the blown elastomeric material forms a part of the tension section of the belt.
5. A transmission belt according to claim 3 or 4, wherein the blown elastomeric material forms a part of the belt section in contact with the cover.
6. A transmission belt according to claim 1 and of double-V cross section, wherein a part of the belt body on each side of its greatest transverse dimension is formed of the blown elastomeric material.
7. A method of making a transmission belt having a body formed of an elastomeric material and a cover enclosing said body, comprising the steps of adding a blowing agent to elastomeric material, building up the belt body so that a part or parts thereof extending throughout its length and bounded by an external surface of the body is or are formed of said elastomeric material to which the blowing agent has been added, placing a cover about the said body so that it contacts said part or parts thereof and heat-curing the said body in a mould cavity to cause the blowing agent to expand and stretch said cover.
8. A method according to claim 7, wherein a reinforcing material is inserted between two sections of the body at the neutral axis of the belt and the part or each part of the body formed by elastomeric material to which the blowing agent has been added is included wholly in one of said sections.
9. A method of making transmission belts substantially as hereinbefore described with reference to the accompanying drawings.
10. Transmission belts when produced by the methods described in any of claims 7 to 9.
11. A transmission belt substantially as hereinbefore described with reference to Figures 1 to 3, Figure 5 or Figures 6 and 7 of the accompanying drawings.

For the Applicants:

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987834 COMPLETE SPECIFICATION
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Sheets 1 & 2

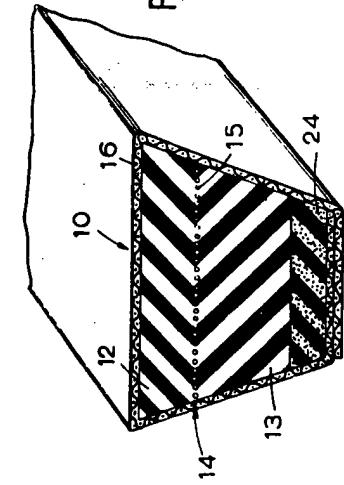


FIG. 1.

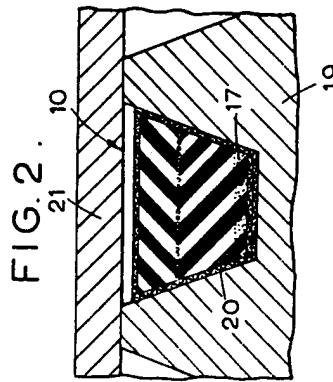


FIG. 2.

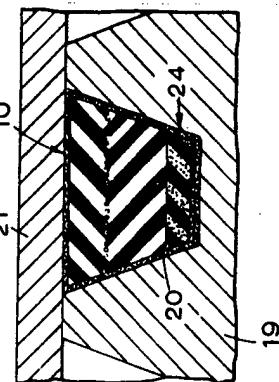


FIG. 3.

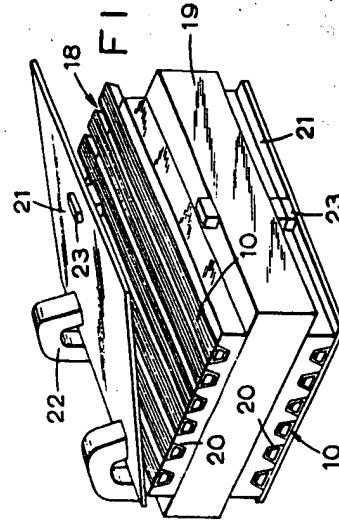


FIG. 4.

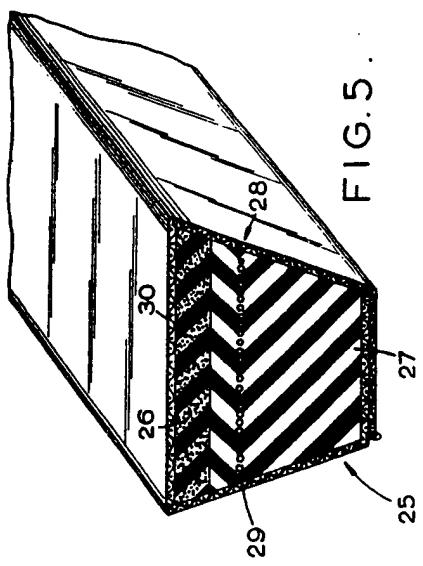


FIG. 5.

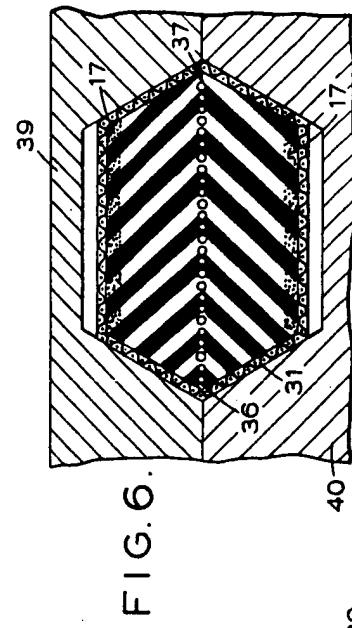


FIG. 6.

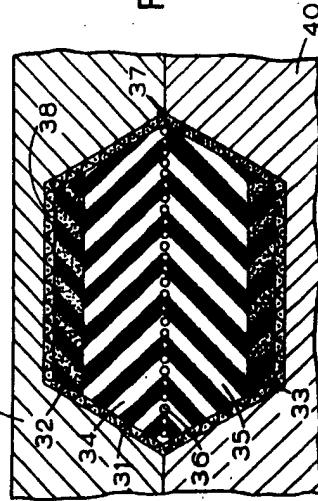


FIG. 7.